Nos. 14-614, 14-623

In the

Supreme Court of the United States

DOUGLAS R. M. NAZARIAN, *et al.*,
Petitioners,

v.

PPL ENERGYPLUS, LLC, *et al.*,
Respondents.

CPV Maryland, LLC,
Petitioner,

v.

PPL ENERGYPLUS, LLC, *et al.*,
Respondents.

On Writ of Certiorari to the United States Court of Appeals for the Fourth Circuit

BRIEF OF LEADING ECONOMISTS AS *AMICI CURIAE* IN SUPPORT OF RESPONDENTS

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TABLE OF CONTENTS

Introduction 1

Argument 2

I. The PSC Orders Replace The Auction Prices For Capacity And Energy That Would Otherwise Be Set By FERC's Regulated Mechanism. 2

II. The PSC-Order Alters Bidding Behavior In The PJM Markets. 6

III. By Altering The Operation Of The PJM Capacity And Energy Auctions, The PSC Order Likely Harms The Economic Efficiency Of The PJM Market. 9

A. FERC uses competitive auctions to ensure cost-efficient operation of the capacity and energy markets. 9

B. The PSC Order creates distortions in bidding incentives and outcomes in the PJM markets that vitiate their performance for economic cost efficiency. 13

Conclusion 15

INTEREST OF AMICI CURIAE*

Amici curiae are leading professors and scholars who teach and write on economic issues and who are concerned about the economic effects that the Maryland Public Service Commission order at issue in this case (and other similar state orders) would have on the federally regulated wholesale electric energy and capacity markets. Many have taught, researched, and published analyses of the economics of the electricity industry. Several have also testified in various proceedings about the nature, structure, and appropriate regulation of electricity markets. Amici curiae have a particular interest in the national policy discussion relating to the architecture and practice of infrastructure regulation.

A summary of the qualifications and affiliations of amici curiae is provided as an appendix to this brief. Amici curiae file this brief as individuals and not on behalf of the institutions with which they are affiliated. Although some of the amici curiae were involved in the proceedings below (as indicated in the Appendix), none is being compensated in connection with this brief.

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* No counsel for any party has authored this brief in whole or in part, and no person other than amici or their counsel has made a monetary contribution to the preparation or submission of this brief. *See* Sup. Ct. R. 37.6. All parties have consented to the filing of this brief through universal letters of consent on file with the Clerk of this Court.

INTRODUCTION

In April 2012, the Maryland Public Service Commission ("PSC") issued Order No. 84815 (the "PSC Order"). In general terms, the PSC Order requires electric distribution companies that supply electricity to Maryland retail customers to enter into long-term contracts with CPV Maryland, LLC ("CPV Maryland"), a Maryland electric power generation company. The contracts required local electric utilities—often referred to as "electric distribution companies" (or "EDCs") and which maintain a regulated monopoly over the delivery of electricity to retail customers—to make payments in connection with CPV Maryland's sales of energy and capacity that would eliminate any difference (whether in CPV Maryland's favor or not) between predetermined contractual prices and the actual clearing prices for capacity and energy in PJM Interconnection, LLC's ("PJM's") wholesale markets.[2]

The purpose of this brief is to provide the Court with an economic analysis of the PSC Order's impacts on the PJM capacity and energy markets. To that end, the brief focuses on three central themes. First, that the pre-determined prices specified in the contracts mandated by the PSC Order alter and replace the PJM auction-determined

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[2] PJM is a regulated, regional transmission organization ("RTO") that operates an electric transmission system in 12 States (including Maryland) and the District of Columbia. PJM does not own power generation facilities or transmission lines, but instead coordinates, monitors, and directs the flow of electricity via the transmission system on behalf of power suppliers and electricity users.

prices for CPV Maryland sales of both capacity and energy. Second, that modification and displacement of the PJM auction prices affect the allocation decisions effected by the PJM markets and the bidding behavior of PJM market participants. And third, that the PSC Order's interference with the operation of the PJM auctions likely harms the economic cost efficiency of the PJM capacity and energy markets.

ARGUMENT

I. THE PSC ORDERS REPLACE THE AUCTION PRICES FOR CAPACITY AND ENERGY THAT WOULD OTHERWISE BE SET BY FERC'S REGULATED MECHANISM.

As a matter of economics, the PSC-ordered contracts establish contractual prices for capacity and energy that displace the market-clearing prices in the PJM auctions that would otherwise apply to CPV Maryland's sales of energy and capacity to PJM. There is no question that terms of the contracts mandated by the PSC Order effectively set the price for capacity and energy received by CPV Maryland, the wholesale seller.

Prices perform three basic economic functions. First, the price is the amount paid by the customer, which influences the customer's decision to purchase the product. Second, the price is the amount received by the seller, which influences the seller's decision to supply the product. And third, the price provides return on investment in capital required to supply the product, which influences investors' decisions to create more capital (or retire existing

capital).[3] Regulation of prices, therefore, involves regulations that control: (1) the amount paid by customers in a manner that may affect customers' purchase decisions; (2) the amount received by sellers in a manner that may affect sellers' supply decisions; or (3) the return on investment in a manner that may affect capital investment decisions. For electric power generators that operate under the PSC Order (the sellers in these transactions and the conduit for new capital investment), the relevant considerations are the amount received by the seller and the expected return on investment.

In Maryland, both of those considerations would be dictated by the contracts issued under the PSC Order. First, the PSC-ordered contracts would effectively determine the prices that the seller (CPV Maryland) would receive for sales occurring in the PJM electricity markets. The net cash flows to CPV Maryland that influence its decision to supply capacity or energy would be determined solely by the terms of the PSC-ordered contracts, and not by the PJM market-clearing prices. This is the second of the three functions of price. Second, CPV Maryland's decisions to invest capital would follow from expectations about prices determined not by the PJM market-clearing prices, but rather by the terms of the PSC-ordered contracts. This is the third of the three functions of price. Furthermore, to the extent that CPV Maryland's participation in the PJM markets would change the market-clearing prices,

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[3] See, for example, Hirshleifer, Jack and David Hirshleifer, Price Theory and Applications, Sixth Edition, 1998, Prentice-Hall, New Jersey, pp. 15-16.

the cash flows for the other market participants—which determine their purchase, supply, and investment decisions—would also be influenced by the PSC Order.

The "Monthly Payment Amount" specified by the PSC-ordered contracts would confer on CPV Maryland revenues that are based on pre-established pricing arrangements, rather than the PJM market-clearing prices. This is evident in the name of the contracts themselves: "Contracts for Differences." The "Differences" at issue in the contracts are the differences between the PJM market-clearing prices and the PSC's pre-established pricing arrangements. If CPV Maryland participates in and clears PJM's capacity or energy auctions (and thus incurs an obligation to supply energy or capacity), the PSC-ordered contracts would ensure that CPV Maryland is "made whole" for any differences between the market-clearing prices and the price specified pursuant to the PSC Order.

As long as CPV Maryland clears the PJM auction, CPV Maryland would receive for any capacity and energy that it supplies the per-unit prices guaranteed pursuant to the PSC Order, regardless of the actual prices for capacity and energy determined by the PJM markets. The PSC-ordered contracts would thus shield CPV Maryland from any capacity or energy market price volatility. If the PSC-ordered contracts set the contractual price for capacity at $200 per unit of capacity, for example, then CPV Maryland would *always* get $200, regardless of the capacity price determined by the PJM market-auction. If the capacity price determined by the

auction were $150, then CPV Maryland would receive $150 from PJM (just like all of the other auction participants) and *an additional* $50 from the distribution companies. The final capacity price for CPV Maryland is thus $200. If the capacity price determined by the PJM market-auction were $250, then CPV Maryland would receive $250 from PJM and pay $50 to the distribution companies. Again, the final capacity price for CPV is $200.

As a result of the PSC Order, CPV Maryland's decisions to supply capacity and energy would be based on the pre-established, PSC-ordered pricing arrangements instead of the PJM auction clearing prices. Similarly, CPV Maryland's capital investment decisions would also be based on the the pre-established PSC-ordered pricing arrangements. Absent the contract terms dictated by the PSC's Order, CPV Maryland would have faced either the PJM market-clearing prices directly or other pricing arrangements developed via voluntary arm's-length negotiations with other entities.[4] Thus, the prices received by CPV Maryland for transactions in the PJM auctions would be regulated by the PSC Order.

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[4] Market participants like CPV Maryland and the distribution companies sometimes elect to enter into a variety of different private arrangements, such as hedges, long-term contracts, or ownership shares. Such wholesale transactions are regulated by the FERC, which grants market-based rate authorization for voluntary wholesale sales of electric energy, capacity and ancillary services by sellers that can demonstrate that they and their affiliates lack relevant market power.

II. THE PSC-ORDER ALTERS BIDDING BEHAVIOR IN THE PJM MARKETS.

Under the contracts issued under the PSC Order, CPV Maryland's motivations toward and interactions with the FERC-regulated interstate capacity and energy markets administered by PJM would be materially altered from what its motivations and interactions would have been absent the PSC Order. CPV Maryland thus would act in a manner that is inconsistent with competitive markets, and CPV Maryland's offer prices into the PJM auction markets would not be motivated to reflect true economic costs.

CPV Maryland's decision to build the St. Charles plant—a 725 megawatt natural gas-fired combined cycle power plant in Charles County, Maryland—demonstrates CPV Maryland's non-market-driven behavior. CPV Maryland repeatedly made statements indicating that it could not have undertaken the construction of the St. Charles plant without the PSC's involvement. For example, CPV Maryland stated:

- "[I]t is vitally important that the [PSC] design [Reliability Pricing Models] and such other regulatory mechanisms as would encourage and accelerate the commercialization of projects such as the St. Charles project...."[5]

- "PJM's capacity market as currently configured is accordingly too short-term and

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[5] PSC Docket Number 9117-178, CPV: "Petition to Intervene and Comments of CPV Maryland, LLC," Sept. 12, 2008, p. 4.

too volatile to provide the secure revenue stream necessary to support the financing of the St. Charles Project and projects like it. [A long term contract] is required to solve this problem and commercialize the Project."[6]

- "[A] project such as the St. Charles Project cannot be financed, and therefore, will not be constructed, without long-term contracts. This simply is a fact under both current and reasonably foreseeable economic conditions resulting not only from the increasingly rigorous finance conditions placed upon large capital projects, but the nature of the [PJM] market structure as well. Simply stated, this Project cannot be built ... unless the Project enters into one or more long-term contracts necessary to support its financing. Accordingly, CPV Maryland respectfully requests that (1) the PSC order one or more of the [distribution companies] to enter into a St. Charles [long term contract]...."[7]

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[6] PSC Docket Number 9117-207, CPV: "Motion of CPV Maryland, LLC for an Order Requiring Investor-Owned Utilities to Enter into Long-Term Contracts for the Sale of Power from CPV Maryland, LLC's Proposed 640 MW Generating Facility in Charles County, Maryland and Request for Expedited Treatment," July 6, 2009, p. 25.

[7] PSC Docket Number 9117-207, CPV: "Motion of CPV Maryland, LLC for an Order Requiring Investor-Owned Utilities to Enter into Long-Term Contracts for the Sale of Power from CPV Maryland, LLC's Proposed 640 MW Generating Facility in Charles County, Maryland and Request for Expedited Treatment," July 6, 2009, p. 3.

Moreover, CPV Maryland has expressly admitted that without the price guarantees provided by the PSC Order, CPV Maryland would not have proceeded with the development of the St. Charles facility.[8]

The PSC-ordered contracts would also provide significant benefits to CPV Maryland that would alter its bidding behavior in the PJM markets. Under the PSC Order, it would be economically irrational for CPV Maryland to base its behavior in the PJM markets on the expected revenues to be gained from the PJM markets rather than on the guaranteed prices that CPV Maryland would receive under the PSC Order. When CPV Maryland clears the base residual or energy auctions administered by PJM (*i.e.*, when CPV Maryland's offer is at or below the market-clearing price), then CPV Maryland would automatically receive the prices set by the PSC-ordered contracts. CPV Maryland need not even consider whether the market-clearing price would cover its economic costs because the market-clearing price is not the price that CPV Maryland would receive.

The structure of the PSC-ordered contracts makes CPV Maryland's capacity-bidding motivation simple: always bid at or below the base residual auction market-clearing price, ***regardless*** of any other economic considerations. Because CPV Maryland would always receive the prices dictated by the PSC-ordered contracts, provided that its bid cleared the auction, CPV Maryland would be indifferent to the

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[8] *See* Pet.App.92a.

level of prices determined in the PJM capacity or energy markets. In essence, CPV Maryland would forego volatile revenues earned from the PJM markets and, in return, it would receive the highly structured capacity and energy revenue streams guaranteed under the PSC Order. CPV Maryland's profit-maximizing bids under the PSC-regulated terms would differ from its profit-maximizing bids absent the regulated terms under the PSC Order.

III. BY ALTERING THE OPERATION OF THE PJM CAPACITY AND ENERGY AUCTIONS, THE PSC ORDER LIKELY HARMS THE ECONOMIC EFFICIENCY OF THE PJM MARKET.

A. FERC uses competitive auctions to ensure cost-efficient operation of the capacity and energy markets.

FERC's decision to establish competitive interstate markets for wholesale capacity and energy transactions is an important element of a broad, long-term policy program. FERC's "[n]ational policy for many years has been, and continues to be, to foster competition in wholesale power markets.... Competition has been the primary approach in recent years for wholesale generation service."[9] The competitive wholesale capacity and energy auctions administered by PJM help FERC achieve its policy goals.

One of the primary benefits of the "pooled" resources under PJM's oversight is that customers'

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[9] See http://www.ferc.gov/industries/electric/indus-act/competition.asp, accessed on January 12, 2016.

collective needs can be met with fewer resources than would otherwise be needed.[10] The "pooled" resources can result in economic efficiencies that lower consumers' average costs, but only when certain conditions are met: the requisite level of generation capacity (or flow of energy production) comes from the lowest cost units within the pool, and the marginal benefit of the last unit of generation capacity (or energy) is at least as high as the marginal cost of having that generation capacity (or energy) available.[11]

The choice to use competitive wholesale capacity and energy markets is a deliberate effort by FERC to determine the prices in those markets that will ensure that these efficiency conditions will be met, rather than requiring a regulator to individually assess the need (or, from an economic perspective,

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[10] A PJM document gives its rough estimate of the value introduced by PJM's administration of the wholesale electricity markets in its region. This document "summarizes the impact of specific elements of PJM's role that produce benefits and economic value for the region it serves. These components of PJM's RTO operations produce as much as $2.2 billion in annual value for the region." (See, PJM, "PJM Efficiencies Offer Regional Savings," p. 1, located at http://www.pjm.com/~/media/documents/presentations/pjm-value-proposition.ashx, accessed on January 11, 2016.)

[11] "In a highly interconnected grid, it is more efficient (less costly) and more reliable to consolidate the dispatch function across several/many interconnected utilities. An RTO does this, consolidating the dispatch function across a wide region to improve reliability and lower costs." (See, Chandley, John, "How RTOs Set Spot Market Prices (And How It Helps Keep the Lights On)," September 2007, p. A-2.)

the cost and benefit) for each and every unit of capacity and energy production.

In the case of generation capacity, for example, PJM states that it's capacity market "ensures long-term grid reliability by securing the appropriate amount of power supply resources needed to meet predicted energy demand in the future.."[12] "By matching energy supply with future energy demand, PJM's capacity market creates long-term price signals to attract needed investments in generation infrastructure to assure adequate power supplies in the PJM region."[13] All else being equal, "high" capacity prices encourage new generation when it is needed (providing increased system reliability), and "low" capacity prices discourage new generation when it is not needed (protecting consumers from being saddled with unnecessary generation and its associated costs).

The PJM capacity market is also designed to create different price signals for different areas within the PJM region, when the balance of benefits and costs varies across these areas. This ensures that financial incentives to increase generation capacity are higher in the specific areas where it is most needed for reliable supply (but only as high as the benefit of having the generation in those areas). Likewise, the PJM energy markets play a similar

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12 http://www.pjm.com/markets-and-operations/rpm.aspx, accessed on January 12, 2016.

13 http://learn.pjm.com/three-priorities/buying-and-selling-energy/capacity-markets.aspx, accessed on January 12, 2016.

role fostering competition and cost efficiency in overall regional supply of wholesale electricity.

FERC's decision to use auction mechanisms reflects the expectation that competitive bidding in the auctions will reflect and reveal accurate marginal values for supply and purchase of capacity and energy. When sellers' offers into the capacity market reflect (in part) the long-run marginal or incremental cost of providing the product (which, for an economist, includes a normal rate of return or "profit" on needed invested capital), then sellers profit from any transactions where the offer price is below the clearing price because the clearing price received for the transaction exceeds marginal cost. Sellers would lose money from any transactions that were to occur with an offer price above the clearing price. (Such transactions do not occur, of course, under the PJM auction rules). When that calculation is the entire consideration for the sellers, they have strong incentives to take into account their true marginal or incremental costs when determining their offer prices.[14]

When considerations other than marginal or incremental cost, such as "strategic" expectations about how the offer price could change the clearing price, affect the behavior of auction participants, then auctions can be less effective at revealing accurate marginal values. Under the PSC Order, CPV Maryland's only incentive with respect to its

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[14] See, McAfee, R. Preston and John McMillan, "Auctions and Bidding," *Journal of Economic Literature*, vol. XXV, June 1987, pp. 699-738.

bidding in the PJM auctions would be to clear the auction—regardless of the market-clearing price—because clearing the auction is a necessary condition for CPV Maryland to receive its contractually pre-determined prices for capacity and energy. CPV Maryland thus would have no incentive to ensure that its offer prices would compensate its marginal or incremental costs, and the resulting lower offer prices from CPV Maryland would translate into lower market-clearing prices in the auctions.

FERC relies on the PJM auctions, and specifically, the market-clearing prices from those auctions, to implement its policy goals. For those market-clearing prices to be effective for the provision of cost efficient reliable energy and capacity, it is important that the market-clearing prices from the auctions reflect competitive market values.

B. The PSC Order creates distortions in bidding incentives and outcomes in the PJM markets that vitiate their performance for economic cost efficiency.

The PSC Order (and the contracts issued under that order) would directly override the PJM market-clearing prices intended by FERC to provide and embody incentives guiding cost-efficient reliable supply and investment. This would affect decisions across the PJM market about whether to build new generation capacity, about what type of capacity to build, and about where to build capacity. For a system of market-price signals to effectively guide the allocation of capacity and energy, all of the

participants must operate on the same price signals. As discussed above, the PSC Order would cause CPV Maryland to receive price signals that are different from those experienced by the other participants in the PJM auctions.

The consideration of expected market prices is critical for investment decisions. The fundamental rationale for the PJM capacity markets is that the developer's choice of plant technology, size, and location should be optimized by market conditions. When that is the case, the anticipated outcome is socially efficient in minimizing the expected economic costs of providing reliable forward-looking market capacity. A potential investor weighing the costs and benefits of investment would carefully consider the risk that and extent to which others' investments might lower anticipated prices so much as to render the investment noncompensatory. In this way, competitive capacity markets successfully align private incentives and interests with the social needs for reliability and economic efficiency. State policies that replace or interfere with FERC's competitive wholesale market prices and their role in guiding investor decisions (*i.e.*, governing when, where and how much to invest), override the incentive functions designed to flow from market-clearing prices in the PJM auctions.

All else being equal, the participation of the subsidized CPV Maryland capacity in PJM wholesale capacity markets would tend to depress prices relative to what they would be in the absence of the subsidized capacity. This conclusion follows directly from the ordinary economics of supply and demand,

since the outcome of the interstate PJM capacity auction system is the setting of prices that equalize supply (aggregated from capacity offers) and demand (modeled to ensure sufficient reliability). As a result, one perverse effect of the PSC Order (in the sense that it is the opposite of the intended result of the stated policy) is to reduce incentives for companies other than CPV Maryland for developing new capacity--both in Maryland and elsewhere in the area served by PJM—by suppressing PJM auction prices.

The PSC Order thus directly contravenes FERC policy and substitutes Maryland's own judgment about the effectiveness of market forces for allocating generation resources. The presence of the PSC Order side-by-side with PJM's capacity and energy markets inevitably erodes expectations that FERC's chosen method to implement policy will continue effectively. For these reasons, the increased uncertainties introduced by the PSC Order would have an inevitable effect on investment by other potential electricity market participants. If that effect were to reduce investment and lower capacity beyond what was added by CPV Maryland pursuant to the PSC Order, then market-clearing prices in the PJM auctions would ultimately be higher reflecting the higher costs of investing in generation, due to additional uncertainty from State regulatory interference with the FERC-regulated wholesale market.

CONCLUSION

If permitted to go into effect, the PSC Order at the center of this case will affect the PJM capacity

and energy markets in three significant ways. First, for CPV Maryland, the capacity and energy prices specified in the PSC Order-mandated contracts will replace the prices determined by the PJM market auctions. Second, the replacement of the PJM auction prices with the PSC-mandated prices for CPV Maryland will alter the allocation decisions effected by the PJM markets and the bidding behavior of PJM market participants. And third, the the economic cost efficiency of the PJM capacity and energy markets will likely deteriorate due to the PSC Order's interference with the operation of those markets. As economists interested in the efficient operation of regulated markets, we hope these fundamental economic propositions are informative to the Court as it considers whether the PSC Order is preempted by FERC's federal regulation of the wholesale electric energy market.

Respectfully submitted,

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APPENDIX

APPENDIX
LIST OF SIGNATORIES

A. Joseph Cavicchi[15]
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Richard J. Gilbert
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[15] Mr. Cavicchi was retained and compensated as a consulting expert by respondents in the trial court proceedings in this case.

[16] Professor Kalt provided expert testimony on behalf of The PPL Companies, The Calpine Companies, Exelon Generation Company, NAEA Ocean Peaking Power, and The PSEG Companies in *PPL Energyplus, LLC v. Solomon*, No. CIV.A. 11-745, 2012 WL 4506528 (D.N.J. Sept. 28, 2012).

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[17] Professor Willig was retained and compensated as an expert witness by respondents in the trial court proceedings in this case. He has been informed by counsel for respondents that, in the event the Court reverses the Fourth Circuit's decision and remands for further proceedings before the trial court, he may be asked by respondents to participate in those remand proceedings (with appropriate compensation).